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Citizens' Bulletin

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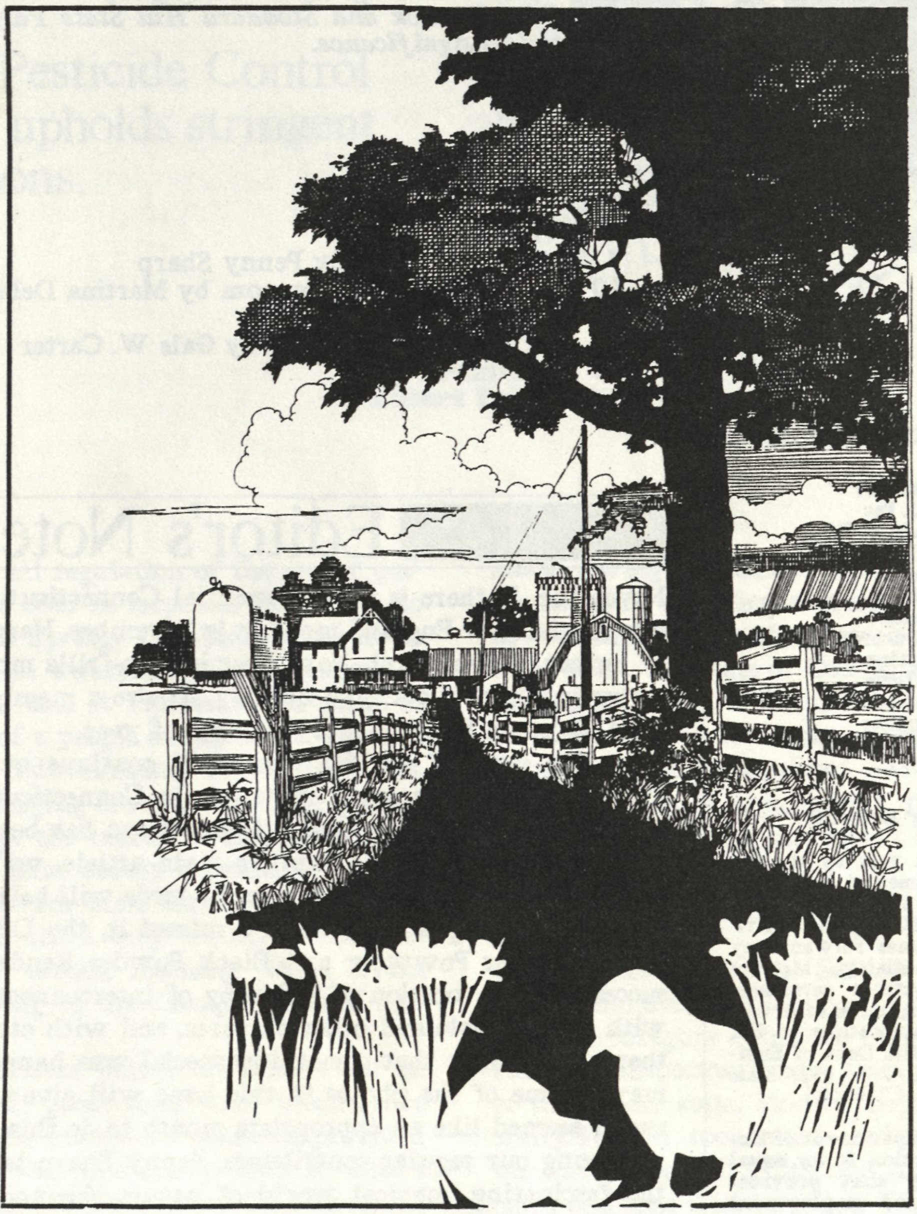
The Connecticut Department of Environmental Protection

DEP's Pesticide Control Section



In Connecticut, the birds continue to sing.
There's a reason for that.

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Editor's Note

November. If there is a quintessential Connecticut month, a month that catches the New England mood, it is November. Hard. Chilly. Bleak. Deadly serious. Triumphant. November is a no-frills month. If you like November in Connecticut, you qualify. You're a member of the club. If not, well, Daytona Beach is nice this time of year.

In this issue of the *Bulletin*, we'll continue our examination of the management of hazardous materials in Connecticut. As is the case with many environmental matters, Connecticut has been in the forefront of pesticide control. In this month's main article, we'll take a look at just what is being done to make sure the birds will be singing next spring.

This past August, in case you missed it, the DEP sponsored the Connecticut River Powwow and Black Powder Rendezvous. It was a great success in its evocation of a feeling of interconnectedness with the land, with other people and other cultures, and with other times. If you were there, you know that something special was happening. If you weren't, maybe some of the photos in this issue will give you a sense of it. November seemed like an appropriate month to do this.

Among our regular contribuors, Penny Sharp takes us once again into the fascinating, magical world of nature she understands so well. The subject of her "Nature Notes" this month is the shrew, a leading contender for "strangest animal in Connecticut" honors.

We hope you like this bleak, bone-cold issue of the *Bulletin*. Have a happy Connecticut Thanksgiving.

R.P.

Why the Birds Continue to Sing

DEP's Pesticide Control Section upholds stringent regulations.

Text and Photos
by
Robert Paier

It has been said that all regulation of the use of pesticides since 1962 has been in response, pro or con, to Rachel Carson's *Silent Spring*. This book was able to focus and articulate an awareness of the dangers of unrestricted pesticide use. It represented a point at which the thinking of a people changed. Ms. Carson's thesis was that the indiscriminate use of pesticides, notably DDT, was bringing about a wholesale poisoning of the planet and the creatures on it, including man. Once many of these deadly chemicals – developed and disseminated for their toxic qualities – entered the food chain, there they would remain, accumulating in fatty tissues, reaching lethal levels, and, ultimately, leading to the disappearance of species.

At one time, DDT was hailed as "the savior of mankind." People of good will and intelligence thought that by its use more food could be provided for a hungry world. We now know that it wasn't quite as simple as that. We now know that there is a balance to nature which, one way or another, will be respected.

It has been almost a quarter of a century since *Silent Spring* appeared. Today, in this country, in Connecticut, significant chages have been made, a new understanding of nature has been achieved and acted upon. The state of Connecticut has rigorous regulations in regard to the use of pesticides, and in many cases has been at the forefront of the national effort to control their unrestricted use.

In the state of Connecticut, the birds continue to sing. That this is the case hasn't been an accident.

The Pesticide Control Section

DEP's Pesticide Control Section is part of the Hazardous Materials Management Unit. Under the direction of Gregory Piontek, the section has three full-time inspectors whose areas of responsibility cover the whole state. Piontek hopes that under a federally-funded cooperative enforcement grant from the Environmental Protection Agency (EPA), another three positions will be added. With his section having completed more than 300 inspections of pesticide applicators, distributors, and manufacturers in the past year, Piontek eagerly awaits additional staff.

"The regulations for pesticide use in Connecticut are strict."

Gregory Piontek

"The regulations pertaining to pesticide use in Connecticut are strict," says Piontek. "The function of the Pesticide Control Section is to uphold these regulations through registration, certification, and enforcement."

Pesticide Regulation

In Connecticut, it is necessary that all pesticides be registered. This includes "general-use" pesticides, which may be purchased over-the-counter, as well as "restricted-use" pesticides. Registration is necessary for insecticides, rodenticides, fungicides, herbicides, disinfectants, pool shocking material, and aquatic weed controls. At this time, there are 6,100 pesticide products registered in the state. The registration process involves a review of each product's chemistry, precautions in regard to use, and possible toxicological and environmental effects.

Certification of Applicators

A further responsibility of the Pesticide Control Section, says Piontek, is the testing and certification of certain applicators of pesticides in Connecticut. In the past year, a total of 1,766 certification exams were administered, with a total of 1,258 applicators being certified.

The two types of commercial applicator certifications are for supervisor and operator. The test for the supervisor certification is "not easy," says Pionte The supervisor is recognized as the decision-maker, who must assume responsibility for the ultimate impact of the pesticide applied. There is, according to Piontek, a 30 to 40 percent pass rate for these exams.

Individual operators must also be certified. This means the technician who actually applies the material. No decision-making responsibility is expected at this level.

Piontek stressed that in Connecticut everyone involved in any commercial pesticide application must be certified. This is not true in all states.

In regard to the private applicator, who is using pesticide on his own land, different rules apply. Certification is only necessary if restricted chemicals are used. This generally includes people involved in agriculture, Christmas tree growing, and dairy farming. The private applicator, however, must submit records of use of restricted pesticides to the DEP on an annual basis.

"The ultimate control on pesticide use," says Piontek, "is the dealer. If you can't buy it, you can't use it." In Connecticut all dealers in restricted pesticides are registered, and the purchase of this material is recorded as to type, amount, and purchaser.

An area in which extremely strict regulation comes into effect is in aerial spraying. In agricultural are broad spectrum pesticides may be used, but not only must the airplane pilot be certified, but release documents must be signed by residents of contiguous areas. The regulations in regard to residential areas are even more strict; the only spraying which may be done in residential areas is with non-chemical, biological products.

Other areas in which the Pesticide Control Section is involved, in conjunction with the Bureau of Fisheries and Water Compliance Unit, are the control of water weeds and algae.

Enforcement

During the past year, the staff of the Pesticide Control Section conducted 304 inspections of pesticide applicators, distributors, and manufacturers. As a result of these inspections, 488 pesticide samples were taken for laboratory analysis.

In addition to routine inspections, the field staff responded to 203 complaints. These complaints were varied in nature, and included concerns about pesticide drift, uncertified applicators, improper sale of restricted-use pesticides, improper pesticide applications, and non-permitted activities.

According to Piontek, the Section has had success in obtaining penalties where they have been warranted. To date, two of the largest penalties, for $25,000 and $15,000, have been levied against uncertified lawn care companies.

Also as part of the enforcement mission, the Pesticide Control Section sends inspectors into the market place, at the retail, distributor, and wholesale levels. The purpose of this is to determine if proper registration, storage, display, and labeling are carried out. During the past year, 181 samples were collected and sent for analysis at the Connecticut Agricultural Experiment Station.

The Agricultural Experiment Station

Under the direction of State Chemist Lester Hankin, the Laboratory Analysis Section of the Connecticut Agricultural Experiment Station performs the analysis of substances as requested by the DEP. This facility is equipped with highly sophisticated technology in order to carry out precise analyses. The Agricultural Station publishes an annual report of the materials analyzed, identifying the substances by manufacturer and brand name, and listing quantity and quality of active ingredients.

An interesting phenomenon, observed by Dr. Hankin, is that in Connecticut the quantity of pesticides used to destroy soil-borne insects, or nematodes, has decreased in 1985 from the previous year by 28 percent. "In effect," said Hankin, "the users of pesticides have been regulating themselves."

Hankin indicated that the state of Connecticut has been at the national forefront in promulgating pesticide regulations. Pesticides, he stated, are clearly not being used as indiscriminately as they were in other times.

> "In effect, the users of pesticides have been monitoring themselves."
>
> Lester Hankin

A Bat Problem

As is often the case in environmental matters, situations are complex, and solutions are not easily arrived at. A recent instance of this involved the presence of bats in a home in a Hartford suburb. The owners of the home called in an exterminator, and the use of the rodenticide "Rozol" was considered. According to DEP Field Inspector Maria Walker, "Rozol" is an anticoagulant; it is a slow-acting poison. There are a number of problems which can result from the use of this chemical. One is that, at least temporarily, the use of the rodenticide increases the chances of bat/human contact, which is what people want to avoid in the first place. Secondly, the poison can have an indirect effect on dogs and cats, in that if a dog eats a poisoned bat, the dog itself might be poisoned.

Often recommended, if possible, is for the family to simply wait out the period that the bats choose to inhabit the house; eventually, they will leave on their own. This is easier said than done, however, as the presence of bats in a home can have, if nothing else, a nerve-wracking effect on the family. Also, more significantly, there does exist the possibility of being bitten by a rabid bat.

On the other hand, said Walker, the bat is a very shy animal, which does not attack humans, and which does consume many pest insects. This situation reflects one of the many dilemmas confronting environmental decision-makers.

In this particular case, the ending was a happy one. The exterminator was able to physically remove all the bats from the home. The home was then "bat-proofed," in that all small openings were sealed. The use of the rodenticide has been postponed indefinitely.

Guidelines

According to Piontek, there has indeed been an increase in awareness of the possible impact of indiscriminate use of pesticides in Connecticut. He expects the future to bring even further reduction in the use of pesticide materials. There are a number of precautions which Piontek feels should be reiterated for anyone considering the use of pesticides:

1: **Don't use a pesticide unless there is a good and clear reason.** Know what you are doing and why.

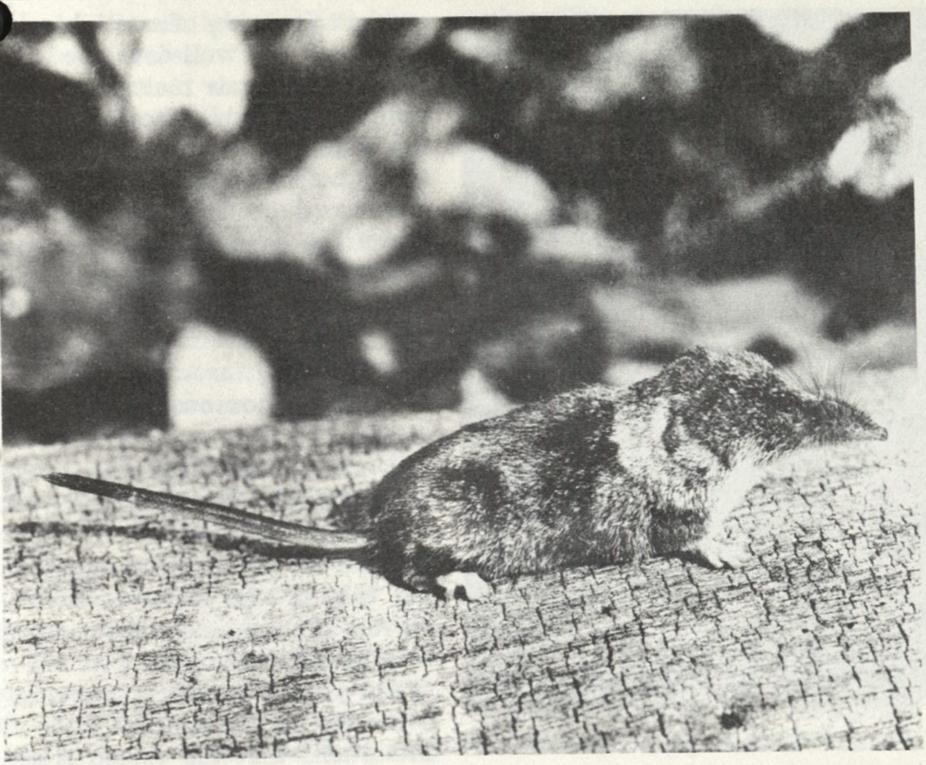
2: **Read the label.** The directions on the label are there for the protection of the user. They explain what the chemical can be used for and what precautions are necessary following its use.

3: **Identify the pest you are going after.** Insects, as well as other pests, have a definitive biology. Correctly identifying the pest will tell you the appropriate control and when to use it.

This is the third in a series of articles on DEP's Hazardous Materials Management Unit.

DEP Field Inspector Maria Walker looks on as applicator James Sarnese explains his plans. The Pesticide Control Section completed more than 300 inspections during the past year.

Nature Notes



Masked shrew: The shrew is one of the most primitive of mammals, living primarily underground, and eating insects. (*Photos: Leonard Lee Rue*)

The Shrew

Pugnacious, bad-tempered, high-strung, and venomous -- but nobody's perfect

by

Penny Sharp

What is covered in dark velvety fur, has more than 30 teeth, and can eat its own weight in a day? The answer: an elusive creature of Connecticut's woods and fields, the shrew. There are several species of shrews to be found in Connecticut. The shrew is among the most interesting, yet probably least known of our mammals.

The shrew belongs – along with the moles – to the order *Insectivora* (insect eaters). Insectivores are the most primitive of all the true placental mammals. All shrew species belong to the family *Soricidae*, which includes the world's smallest mammal, the musk or dwarf shrew, weighing in at 2 grams (0.08 oz.).

The shrew is a small animal with a long, pointed snout, short legs, and small, beady eyes. The ears are small and usually concealed in the short, soft fur. Most species live primarily underground, and the fur is adapted to this life in that the hairs are not displaced by movement in any direction.

A Difficult Pet

The shrew is reputed to be pugnacious and bad-tempered. How the name came to mean "a woman of violent temper and speech" (Random House Dictionary) I leave to the reader's imagination. Perhaps it has to do with the shrill sounds that the shrew emits when threatened, or its seemingly bad disposition. Robert Burton tells us: "Every man, as the saying is, can tame a shrew, but he that hath her." I imagine the shrew might be a difficult pet.

The shrew has a high metabolic rate. In one species, the heart rate was measured at 1200 beats per minute, with the average respiration rate equally rapid. With this high expenditure of energy, the shrew needs continual refuelling, and consumes enormous amounts of food. It is a high-strung, nervous little animal, and has been known

Masked shrew: A masked shrew has been observed to eat three times its body weight in a 24-hour period.

to die of shock if frightened.

The shrew is killed, but seldom eaten, by a number of animals. This is probably because of the strong musk that it emits, which gives it a bad taste. Predators include herons, owls, hawks, weasels, foxes, and cats.

The Short-tailed Shrew

One of the most common shrews in Connecticut is the short-tailed shrew (*Blarina brevicauda*). This shrew is larger than most of its relatives (four to five inches in body length). Its tail measures about an inch long. Male and female are colored alike, being slate-colored above and pale on the underside.

The short-tailed shrew can be found in a variety of habitats. In wooded areas, this shrew tunnels around in the leaf litter searching for food. It can also be found in and around the banks of small streams, in brush piles, and in overgrown fields.

For shelter, the short-tailed shrew takes to places such as mole runways, stump cavities, stone walls, or crevices in building foundations. This shrew builds two types of nests: a small nest for resting, and a large nest for mating and rearing the young. Nest materials include leaves, grass, and other plant materials. Normally, there are three openings at the nesting site: one at the bottom for escape purposes, and one at each end of the burrow or cavity.

The short-tailed shrew is active throughout the year, both day and night. The activity level, however, seems to be highest on damp or cloudy days. During the day, the short-tailed shrew is mostly hidden, traveling under leaf mold or through subterranean passageways. At night, it surfaces and ranges above ground in search of food. This shrew has been observed climbing trees and it is also capable of swimming. During winter months, it tunnels through the snow, occasionally breaking above it.

As one might expect for an animal that spends much of its time underground, this shrew has poor eyesight. Its senses of smell, hearing and touch are well-developed. The short-tailed shrew maintains a constant twitter while feeding and going about its business. When the shrew becomes alarmed, the twitter gives way to a shrill, high-pitched chattering sound. Even the very young are endowed with this ability and are vocal at eight days of age.

The Venomous Mammal

The short-tailed shrew is distinguished from other mammals by its venomous bite. The venom is secreted from the sub-maxillary glands at the base of the lower incisors. It travels along a groove between the long incisors and mixes with saliva. When prey is bitten, it is quickly overcome by the venom. There are indications that the venom is similar to that of some venomous snakes, particularly the cobra.

The shrew is an almost constant feeder. The diet includes insects and insect larvae, as well as earthworms, small crustaceans, snails, slugs, spiders, and salamanders. When animal food is unavailable, the shrew will eat fruits, nuts, and roots. It is known to cache food in its burrow.

It is believed that the short-tailed shrew produces two to three litters per year. Up to 10 young may be born at one time, although five to seven is the normal litter size. The young are born blind and helpless, but grow rapidly. By 14 days, they are covered with fur and beginning to crawl. They are ready to leave the nest after 18 to 20 days and are fully weaned at 25 days.

The Masked Shrew

The masked shrew (*Sorex cinereus*), one of the long-tailed shrews, is a small animal with a sharp, pointed nose and beady eyes. It is covered with thick fur which is a rich dark-brown above and lighter grayish-brown underneath. In summer, [illegible]e coloration is lighter and the feet are nearly white.

The masked shrew is found throughout Connecticut and is widely distributed throughout North America, ranging from Alaska to the mountains of Tennessee. It prefers wooded areas and inhabits deciduous and coniferous forests. This shrew shows a preference for cedar bogs, hemlock ravines, and thicketed streambanks where water does not freeze.

The greater part of the masked shrew's time is spent in its underground tunnels. This shrew builds a nest about three inches wide from grasses, dry leaves, and plant rootlets. The nest is usually located in a stump or under a log or stone wall.

The masked shrews has a voracious appetite, and one in captivity was observed to eat more than three times its own weight in a 24-hour period. The masked shrew is a feisty little creature, easily provoked into fights. It will devour its own kind.

Members of this species swim well, but do not often enter the water. When above ground, they usually roam about the surface searching for food, nose first. Occasionally, they climb into shrubs or over fallen trees in quest of a meal. The diet includes an enormous variety of insects and worms, mollusks, and occasionally young birds and mice.

It is believed that the breeding season is from March to September, and that more than one litter is produced. Litter size is from two to 10, with seven being the norm. The young are independent after about one month. The male parent stays with the female until the young depart.

The Northern Water Shrew

One of the more interesting of the shrews found in Connecticut is the northern water shrew (*Sorex palustris*). It is the largest long-tailed shrew, having a total length of six inches. This shrew is well-adapted for its semi-aquatic life. The third and fourth toes of its large hind feet are fringed with hairs and joined by a thin web. This feature enables it to be a strong swimmer.

Both male and female are similar in appearance, with the upper parts of the body being dark gray with some white-tipped hairs. The underparts of both body and tail are white.

The water shrew inhabits wet areas alongside streams and ponds. It prefers a wooded swamp environment. This shrew remains active throughout winter. It is primarily nocturnal, although it also moves about at dusk and on overcast days.

The water shrew is an expert swimmer and diver. When underwater, a coating of air bubbles surrounds the fur and gives the animal tremendous buoyancy. It swims about, probing with the long snout for food hidden among the rocks and sand. The water shrew has been observed actually running across the surface of water, partially supported by suface tension. Distances of five feet or more have been covered in this way.

The water shrews feeds on aquatic insects, including mayflies, caddisflies, and water beetles. Snails, small fish, and fish eggs are also consumed.

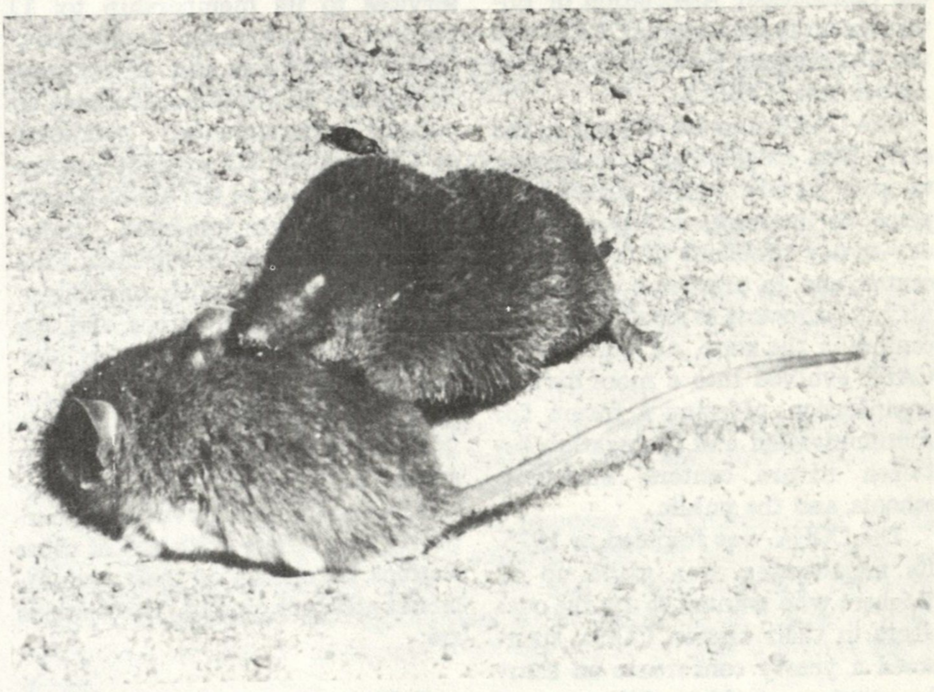
The water shrew may build its nest in abandoned beaver or muskrat lodges. The nest is about four inches wide and is made of dried sticks and leaves.

The breeding season is thought to last from February to June, with more than one litter produced during a year. From four to eight young are born following a gestation period of 21 days.

A Beneficial Animal

These are a few of the shrews that occur commonly in Connecticut and can be observed if one knows where and when to look. I have seen them often during the winter when they emerge from their snow tunnels.

Despite its bad reputation, the shrew is a beneficial animal; it consumes enormous quantities of pest insects. The shrew is the chief enemy of the European pine sawfly, and helps keep numbers down during outbreaks of this pest. ■



Short-tailed shrew attacking a white-footed mouse: The bite of this shrew is venomous, and has been compared to that of the cobra.

Toward the Classroom

A Merger in the Environmental Community

by
Martina Delaney
Environmental Education Coordinator

Mergers are common occurrences in this state. We read about them almost weekly on the business pages of our newspapers. This year a new merger has taken place, not in the back rooms of the corporate world, but in the environmental community.

Connecticut has been fortunate over the past decade to have had two statewide organizations to which environmental education professionals could go for materials and technical assistance. These were the Connecticut Association of Environmental Educators (CAEE) and the Connecticut Outdoor Education Association (COEA).

The CAEE was established in the early '70s. Its original purpose was to give nature center directors a place to interact, to discuss the day-to-day problems of operating a center, and to provide an opportunity for directors to see other nature centers in the state. As time passed, CAEE evolved into a more diverse organization, offering a forum for communication and cooperation between nature centers, museums, schools, and the public.

The COEA was founded in 1975. Its membership was made up of teachers who wanted to use the outdoors in their classes. COEA sponsored a yearly conference on sharing outdoor teaching skills, nature facts, and exploring environmental issues. Teachers who wanted to know "how and what" to share with their students were well served by this association.

This year, after lengthy review and membership approvals, the two organizations felt there was enough common ground to reorganize into one new statewide association. Together, they are now the Connecticut Outdoor and Environmental Education Association (COEEA).

As a more widely oriented group, the new COEEA will be expanding services to its membership to: 1) conduct and organize professional training programs and workshops; 2) organize an annual conference on outdoor/environmental education in Connecticut; 3) provide professional assistance in the development of outdoor/environmental education programs; and 4) establish lines of communication with professional educational institutions and the public to promote interest in outdoor/environmental education.

The new organization will provide three association sections for members to participate in. Prospective members will have the opportunity to affiliate with one of these sections, depending on their own interests and background. The sections are:

1. Elementary and secondary education.
2. Environmental and natural history interpretation.
3. Environmental research and policy.

The executive board will not only have the positions of president, vice-president, etc., but also one representative from each of the eig Connecticut counties and one re resentative from each of the three sections will take part.

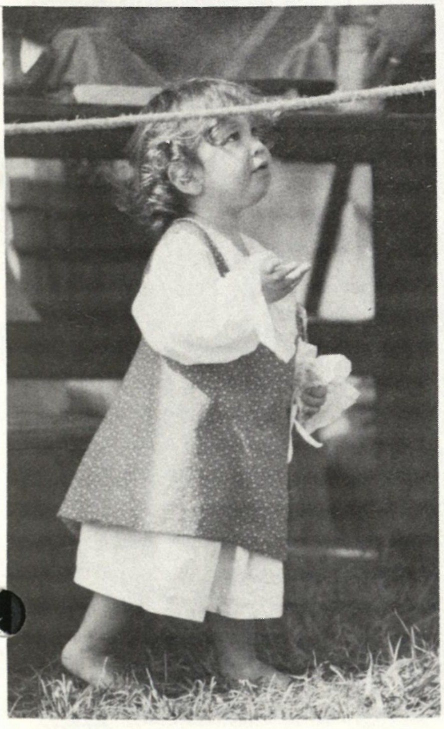
This coverage will maximize communication statewide. It will bring together people active in environmental and outdoor education in an organization working toward a more informed, skilled, and professional membership.

The members in this new association have the same basic love for nature and desire for a high quality of life for all of us. They feel this can be best achieved and maintained through education.

If you would like further informtion on COEEA, contact Tom Mason, West Rock Nature Center, Wintergreen Ave., P.O. Box 2669, New Haven, CT 06515, or phone 787-8016.

If your nature center or environmental organization wishes to publish an announcement in the January, 1987, *Citizens' Bulletin*, please contact DEP, Information and E ucation Unit, 165 Capitol Avenue, Hartford, CT 06106, Att: Martina Delaney, by November 15. ■

R. Paier



C. Paier

A Celebration of Spirit

The 1986 Connecticut River Powwow and Rendezvous

This summer, the DEP sponsored one of the largest Indian powwow gatherings in New England. It was held in combination with black powder muster demonstrations, "mountain men" exhibits, and reenactments of scenes from the lives of the first European settlers.

Something rather special happened at that event. History came to life. Other cultures, other times, other realities, were somehow, almost magically, transported across the centuries.

Suddenly, you were in a world of trappers and frontiersmen, of lavishly-feathered Indian dancers, of solemn, dignified elders and medicine men, their eyes twinkling with humor and ancient wisdom. The event was a celebration of the togetherness of all people in all times; it was a celebration of life in harmony with the earth; it was a celebration of spirit.

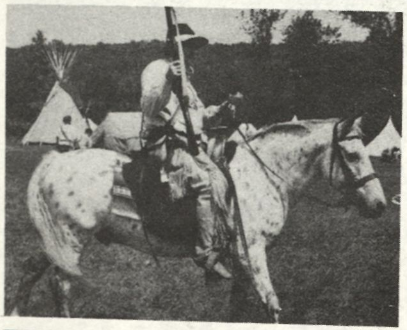
It is a good sign that that spirit is still strong. It is that spirit which we must draw upon as we fulfill our responsibility to the future.

J. Laforte

J. Laforte

C. Paier

R. Paier



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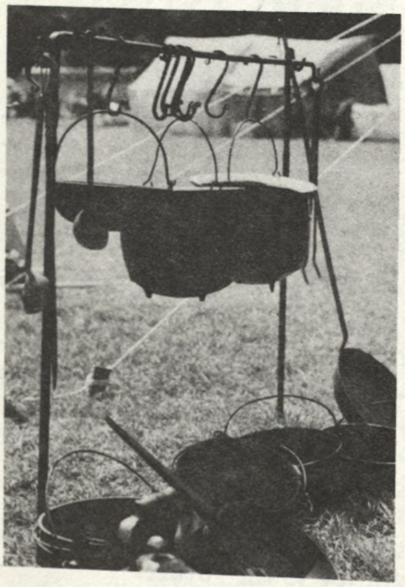

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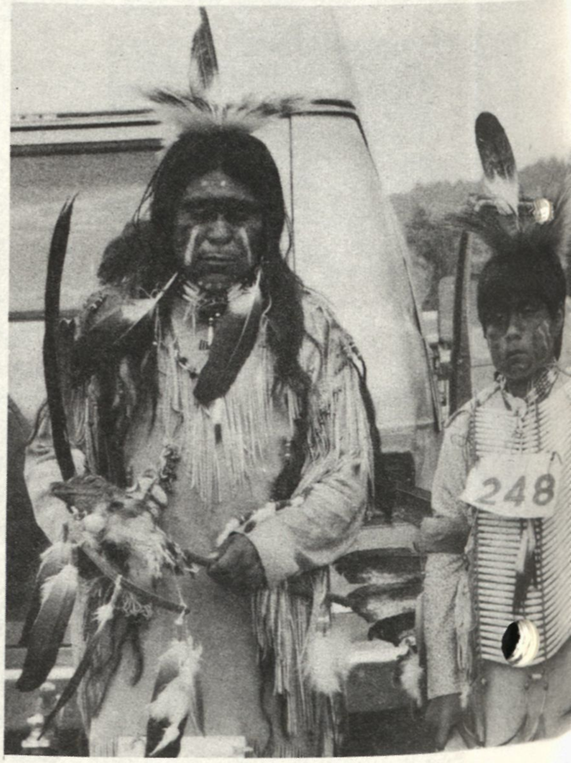

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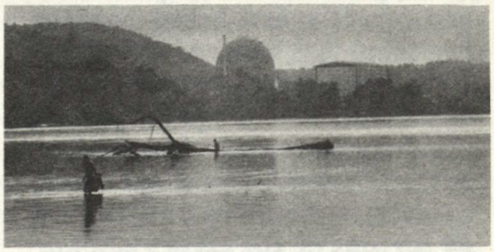

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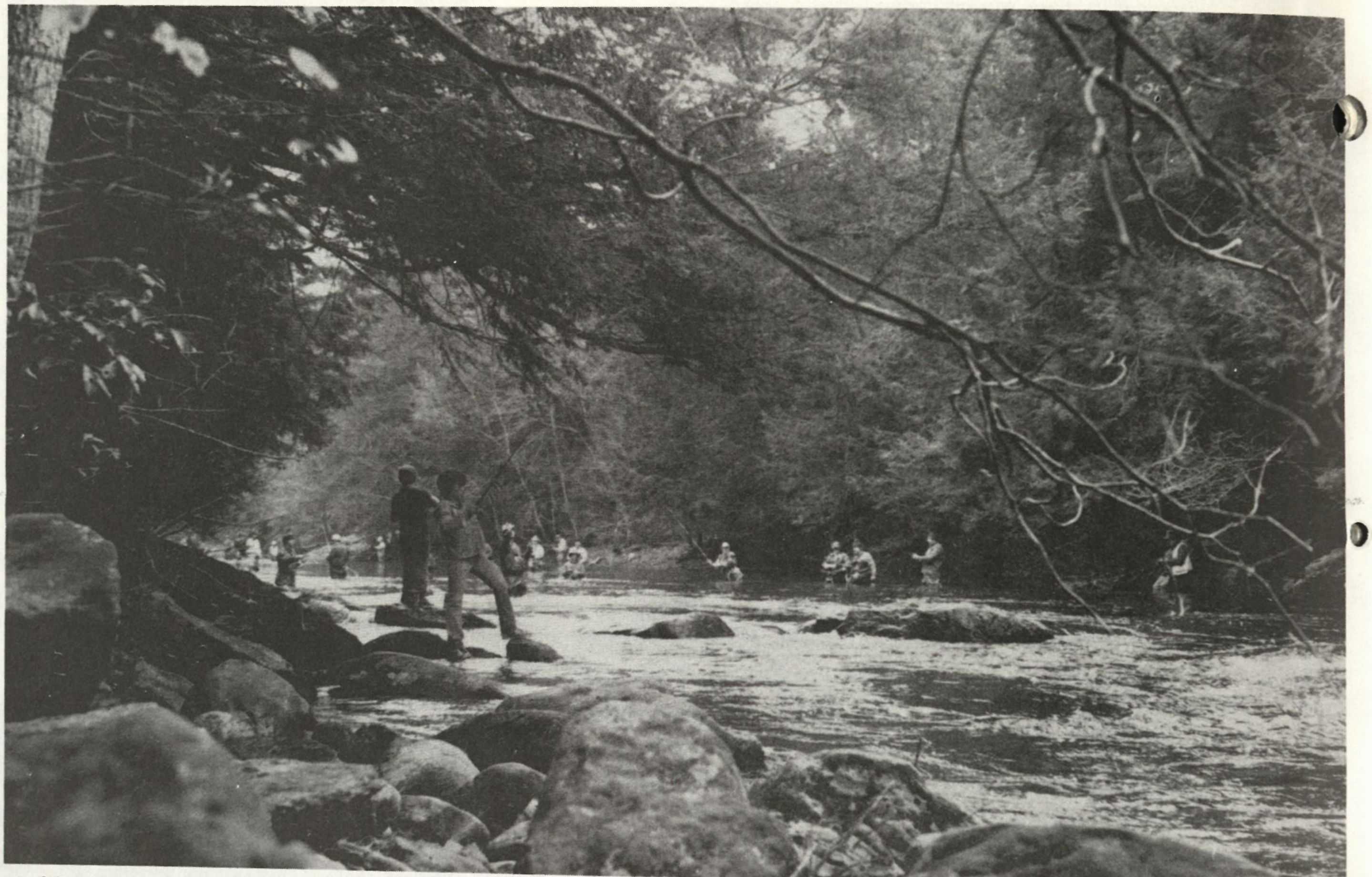


Achieving the goal of fishable-swimmable water quality will require regulation and, in some cases, elimination sources of pollution. (*Photo: Tom O'Brien*)

A Report on Connecticut's Rivers and Streams

Stanley J. Pac, Commissioner of the DEP, recently released the "1986 Water Quality Report to Congress" which indicates continued improvement of Connecticut's rivers and streams. The report states that over 90 percent of our estimated 8,400 total miles of rivers and streams exhibits water quality consistent with state and federal goals. The report indicates, however, that the larger rivers and streams are being heavily impacted by human activities. This is occurring, in particular, as a result of sewage treatment plants, industrial discharges, and municipal combined sewer overflows. For this reason, just 68 percent of the state's 880 major river miles meets "fishable-swimmable" standards. The following has been extracted from the report's executive summary.

Fishable-Swimmable Waters

Great progress has been made in improving the quality of the state's waters since the passage of Connecticut's Clean Water Act in 1967, and the 1972 Federal Water Pollution Control Act Amendments. However, maintaining or achieving the dual goals of "fishable-swimmable" surface water quality and adequate supplies of unpolluted groundwater for drinking will require considerable effort to regulate and – in some cases – eliminate sources of pollution.

Connecticut's Water Quality Standards and Criteria

A key element in the program is Connecticut's Water Quality Standards and Criteria (WQS). In Connecticut, water quality standards guide water quality management programs for both surface and groundwater resources. Water resources are classified according to the use to be protected, such as drinking water supply, fishin swimming, or other recreatio uses. They are further classified by identifying the criteria necessary to protect such uses. Regulation of wastewater and leachate discharges must be consistent with use goals established by the WQS process.

It is estimated that there are 8,400 total miles of rivers and streams in Connecticut, of which well over 90 percent exhibit water quality consistent with federal and state goals. The larger rivers and streams, however, are more heavily impacted by man's activities. It is estimated that as of 1986, 68 percent of Connecticut's 880 major river miles fully support designated uses. This, however, is a significant improvement over 1972 conditions. This less-than-full support of designated uses has been attributed to: municipal sewage treatment plants (40 percent), toxic and conventional pollutants from industrial discharges (30 percent), municipal combined sewer overflows (20 percent), and non-point sources (10 percent).

Recreational Lakes

There are 70 major recreational lakes, accessible to the public, in the state. Approximately 89 percent (by area) of these lakes have water quality supportive of full recreational use. The most common water quality concern is the growth of nuisance weeds and algae caused by nutrient enrichment. Nutrient inputs to these lakes have been attributed to natural sources (68 percent), as well as to non-point sources, such as septic systems, fertilizers, erosion and sedimentation, and stormwater run-off (32 percent). The elimination of federal funding under Section 314 of the Clean Water Act reduces the ability of the state to conduct additional studies or to implement recommendations for lakes previously studied.

Municipal Sewerage

The DEP's municipal sewerage construction grant program has been responsible for major improvements in water quality. This has been brought about by eliminating discharges of untreated and partially-treated sewage from nearly all rivers in the state. In 1972, only 62 percent of the municipal sewage treatment plants (STPs), serving 30 percent of the sewered population, provided secondary treatment or better. By 1986, this increased to 97 percent of the plants serving 97 percent of the sewered population. In addition, permit compliance for significant municipal facilities has increased from 31 percent in 1972 to 82 percent in 1985. In the period from 1972 through 1985, approximately $1,869,000,000 has been spent on public sewerage facilities in Connecticut.

Progress in the construction grant program has been slowed by reductions in the federal sewage construction grants authorizations. In 1986, the state Legislature created a new state financial assistance program establishing a revolving, low-interest, loan/grant program to meet project needs. This program would provide about $45 million per year.

Industrial Discharges

As of this year, 1,038 industrial discharges were under the National Pollution Discharge Elimination System (NPDES) permit control. Most of the limits are equal to or more stringent than "Best Achievable Technology," as defined by EPA. For significant industrial facilities, permit compliance has increased from 24 percent in 1972 to 77 percent in 1985, as measured by effluent compliance and compliance with abatement order schedules.

The DEP also administers a statewide pretreatment program for non-domestic wastewater discharges to public sewerage facilities. This permit program imposes the same treatment standards as are applied to direct stream discharges. The pretreatment program currently regulates approximately 350 industrial discharges.

Non-Point Sources

DEP's surface water quality programs have focused primarily on point sources of pollution, i.e., industrial and municipal wastewater discharges. Non-point source (NPS) pollution, however, such as run-off from agricultural operations, construction sites, and urban areas can cause local pollution problems. NPS strategy includes developing programs that require or encourage "Best Management Practices."

Long Island Sound

Long Island Sound, the major marine resource in Connecticut, has also benefitted from improved municipal and industrial wastewater treatment. The most heavily impacted areas are the urbanized harbors and tidal portions of the major tributary rivers. Approximately 20 percent of the 600 square miles assessed are suspected of having water quality problems.

Due to limited resources, most of Connecticut's portion of the Sound is not comprehensively monitored. This is a particular concern to the DEP, since western Long Island Sound is reported to exhibit nuisance algae and phytoplankton blooms and, quite possibly, dissolved oxygen problems. However, 1985 marked the start of the $4 million EPA-funded Long Island Sound Water Quality Study, in which DEP is an active participant.

Looking Ahead

The DEP continues to administer an aggressive water quality management program. Comprehensive planning has become critical, as the remaining water quality management problems are interrelated and complex.

The DEP is optimistic that this progress can continue, and that the goal of fishable-swimmable quality for all waters can be achieved. The availability of adequate, unpolluted groundwater for public consumption is an equally important goal. Success will depend on a strong state water pollution control program, strong federal support, and involvement of local officials in water quality management programs. ■

Three states work together to improve the New England forest.

Yankee Forest Cooperative Project

The concept of multiple-use is based on informed, sensitive forest management. (*DEP file photo*)

The top environmental officials of Connecticut, Massachusetts, and Rhode Island have launched a joint project aimed at enhancing the economic and environmental benefits of southern New England's 6.2 million acres of forest land. Nearly 90 percent of this land is privately owned.

The project emphasizes informing the public of the need to upgrade urban and rural woodlands through advanced forest management, utilization, and marketing techniques. Called the Yankee Forest Cooperative Project (YFCP), it is based on the concept of "multiple use," which holds that informed, sensitive management will improve the forest's economic value and environmental quality.

The kickoff ceremony was held at Old Sturbridge Village within the project's million-acre, tri-state demonstration area. Major participants were: Dennis DeCarli, Deputy Commissioner, Connecticut DEP; James Gutensohn, Commissioner, Massachusetts Department of Environmental Management; Robert Bendick, Director, Rhode Island Department of Environmental Management; Thomas N. Schenarts, Director, Northeastern Area. Invitees included representatives of environmental groups, industry, other government offices, and universities.

The project is administered by a steering committee made up of the three state environmental agency heads and the northeastern area director. Other participants are: Robert L. Garrepy and Henry N. Deion, Jr., the state foresters of Connecticut and Rhode Island, respectively; Gilbert A. Bliss, the director of the Massachusetts Division of Forests and Parks; Tom Quink, chief forester of Massachusetts; Richard Obyc of the northeastern area, the YFCP coordinator; and chairpersons of the YFCP subcommittees.

Background

Approximately two thirds of southern New England's nine million acres are forested. The major forest types are white pine, oak-pitch pine, red maple, Atlantic white cedar, and mixed stands of white pine, oak, and other hardwoods.

Public agencies own and professionally manage nearly 10 percent of these woodlands. About 73 percent is owned by private individuals with holdings of less than 50 acres, 13 percent is held by farmers, a four percent belongs to wood industries. Most of the private forestland is not managed according to professionally-designed plans.

Goals

The project has six goals designed to strengthen the management and use of southern New England's forest lands:

1. Information and Education. Tell the public about the value of good forest management practices through an emphasis on the project goals and the benefits expected from the activities undertaken.

2. Forest Protection. Encourage landowners to reduce the destructive influence of forest fires, forest insects and diseases, and poor land management practices that cause excessive soil loss and lower water quality.

3. Wood Resource Development. Expand the range of markets for wood products and put into the hands of users the latest technology in timber harvesting and wood processing.

4. Management Strategies. Practice techniques of managing the forest for its multiple uses, including wildlife habitat, clean waters, esthetics, and recreation.

5. Urban Forestry. Improve the urban environment by using advanced tree management practices in those settings.

6. Yankee Forest Demonstration Area. Establish an area around the convergence of the three states to demonstrate the benefits of sound forest management practices. ■

gning the Yankee Forest Cooperative Project agreement at Old Sturbridge Village, Massachusetts, on May 21, 1986: Thomas N. Schenarts, Director, USDA-Forest Service, Northeastern Area; James Gutensohn, Commissioner, Massachusetts Department of Environmental Management; Dennis P. DeCarli, Deputy Commissioner, Connecticut DEP; and Thomas A. Dupree, Acting State Forester, Rhode Island Department of Environmental Management.

Under siege at Fort Shantok in 1642, Uncas may have looked out at this view of the Thames River as he waited anxiously for the arrival of supplies.

State Parks Reflect Connecticut's Indian Heritage

Text and Photos
by
Martha Kelly
Environmental Intern

Fort Shantok State Park

Fort Shantok, one of Connecticut's smaller state parks, is rich in history and natural beauty. Located in Montville, off Route 32, the park is the site of an ancient Mohegan village and fortification, and includes the site overlooking the Thames River known as Uncas' Chair. In addition to its historic significance, the park offers a wide choice of lovely picnic sites — many of them handicapped-accessible — plus opportunities for hiking and freshwater fishing.

The Site

Fort Shantok's 170 acres include a wide variety of natural settings. Rolling hills greet the visitor, a lovely view which is followed by the sight of Tantaquidgeon Pond, a tranquil spot favored by the local duck population. There is enough open space to satisfy the most energetic frisbee player and accommodate horseshoe pits as well. A lovely wooded picnic area is beyond the playing fields, its many tables clustered on the shores of a meandering brook, sheltered by tall pines, and framed by a grove of mountain laurel.

The Mohegan fort site is deep in the park, on the bank of the Thames River. Its terrain made this spot a natural choice, for its features make it readily defensible. Set on a hilltop terrace, the fort site is a long triangular area, 600 feet long and 300 feet at its greatest width. On the river side, a steep bluff drops off 50 feet to the Thames, offering a vantage point which the Mohegan sachem, Uncas, is reputed to have used as a look-out. The remaining long border is an equally steep and lightly-forested slope — an attacker trying to scale it would have been at a serious disadvantag
The hill is connected to the main land area by a narrow neck across which a wooden palisade created an effective defense.

Area History

Besides having been the site of a long-standing Mohegan village and fortification, Fort Shantok is believed to have been the site of some of Connecticut's earliest Indian/white contact. Archeological excavations have revealed early trade goods of Dutch origin on the site; Dutch traders and explorers are known from historical records to have reached the area by 1614.

Extensive archeological digs were carried out in the 1960s under the supervision of a Columbia University archeologist. The findings from these digs suggested that at least three forts were built upon the site, all probably built and destroyed during the 17th century during periods of political instability among area Indian tribes. Indications of the diet and trade contacts of the Mohegans, as well as indications that wampum was manufactured on the site, have also been found.

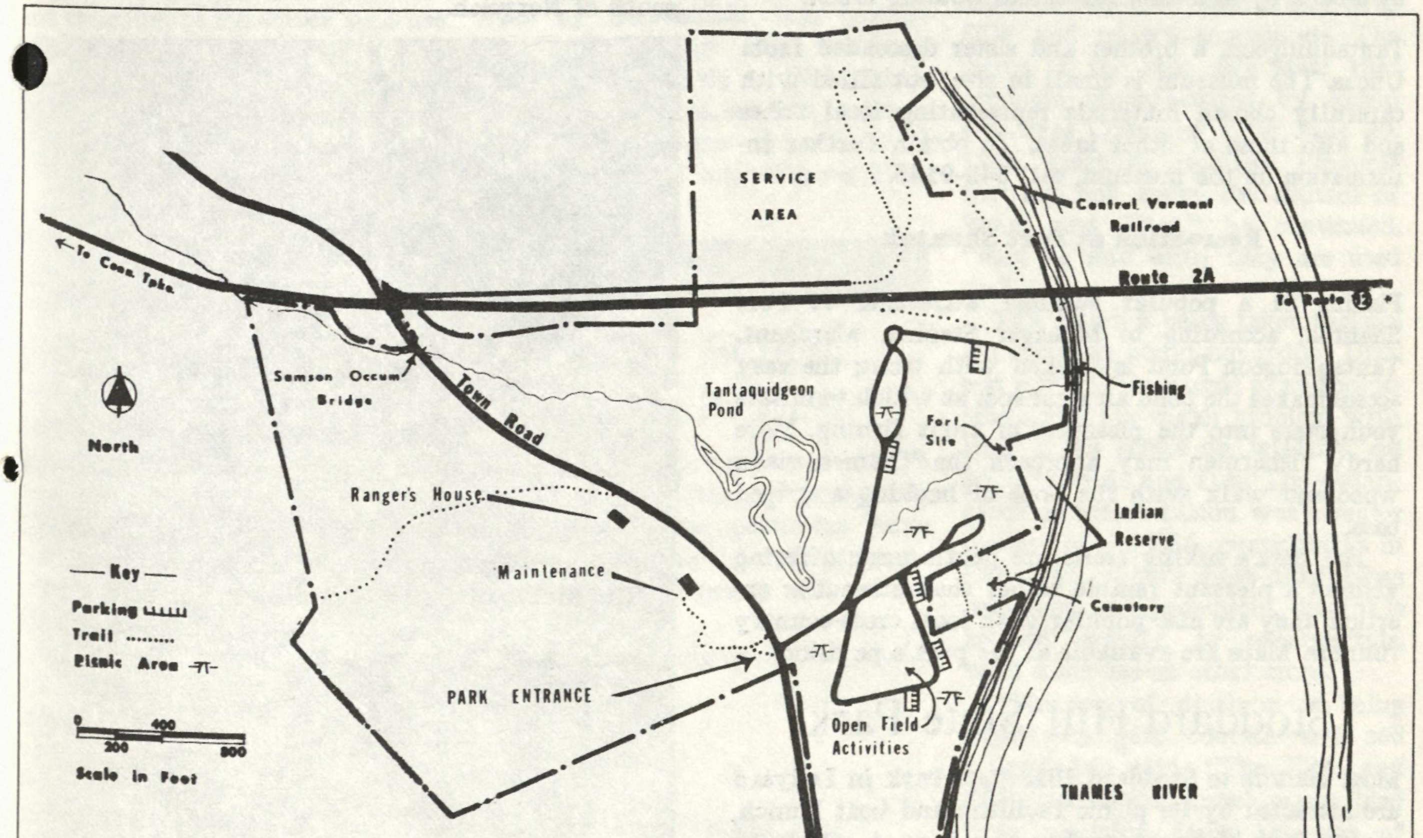
The Origin of the Mohegans

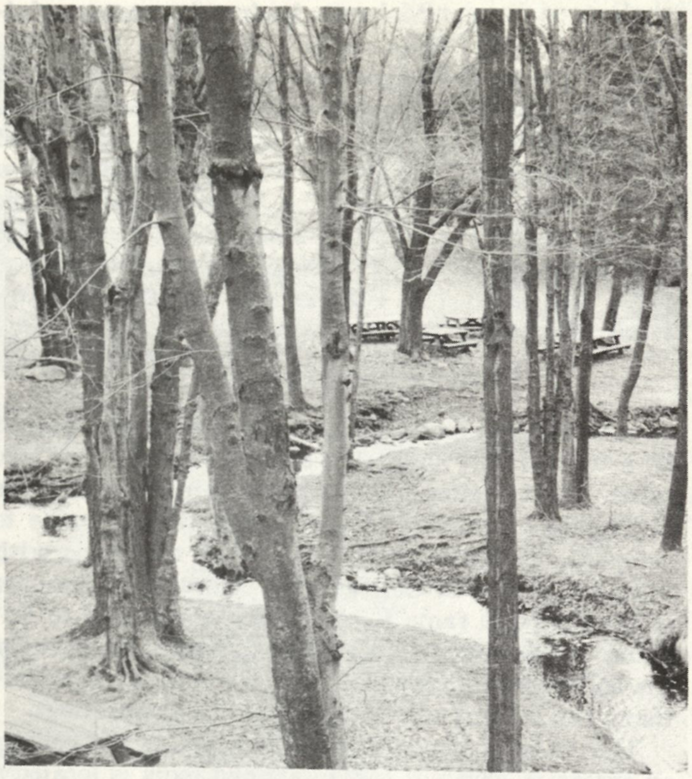
The origin of the Mohegan tribe is the focus of scholarly debate. Some investigators believe this group to have entered New England from upstate New York shortly before the time of the first European contact. There seems to be no doubt that Uncas, a local sachem, challenged Pequot/Mohegan leadership unsuccessfully several times in the 1630s. Following his participation in the white-led massacre of the Pequots in 1637, he formed a separate tribe under the Mohegan name. This may have been a revival of an older tribal name "Mahican," associated with the possible New York state origins of the tribe. Uncas' support of the British in this period established a bond that was to help him later when, in the 1640s, a series of wars broke out between the Mohegans and the Narragansetts.

Nearby Points of Interest

If your interest in the area's Indian heritage is piqued by a visit to Fort Shantok, you may wish to visit two other nearby sites. A plaque commemorating the birthplace of Samson Occum is near the entrance to the park. This remarkable man raised the funds with which Dartmouth College was founded. A preacher of considerable fame in America, he traveled to England and Scotland in search of financial support for the college, which was originally conceived as a seminary for Indians and to be located in Connecticut.

The Tantaquidgeon Indian Museum, which offers an extensive array of Indian art and tools, is located a short distance away, on Route 32. Open between May and October, it is the lifework of Harold and Gladys





Fort Shantok State Park in Montville offers many attractive spots for outdoor dining; this one is framed by a bank of mountain laurel and winding brook.

Tantaquidgeon, a brother and sister descended from Uncas. The museum is small in size, but filled with carefully chosen materials representing local tribes and also those of other areas. To obtain further information on the museum, call 848-9145.

Recreation at Fort Shantok

Fishing is a popular summer attraction at Fort Shantok, according to Manager Stephen Merchant. Tantaquidgeon Pond is stocked with trout; the easy access makes the pond an ideal spot at which to initate youngsters into the pleasures of trout fishing. More hardy fishermen may approach the Thames via a woodland walk with the hope of hooking a striped bass.

The park's hiking trails are gentle ones, offering visitors a pleasant ramble rather than strenuous exertion; they are also popular with local cross-country runners. Maps are available at the park's pavilion.

Stoddard Hill State Park

Most visitors to Stoddard Hill State Park in Ledyard are attracted by its picnic facilities and boat launch, reports Park Manager Stephen Merchant. A relatively undeveloped state park, it is a popular roadside stopover for picnickers, who may catch sight of a pair of swans in its sheltered cove. Easy access to the Thames River draws fishermen in search of striped bass.

Access to the river by boat is limited by a railroad bridge which spans the exit from the cove. Tidal fluctuations under this low bridge tend to limit this launch to fairly small boats. The park features fishing access for wheelchair fishermen by means of ramp and projecting platform built by the Connecticut Conservation Corps.

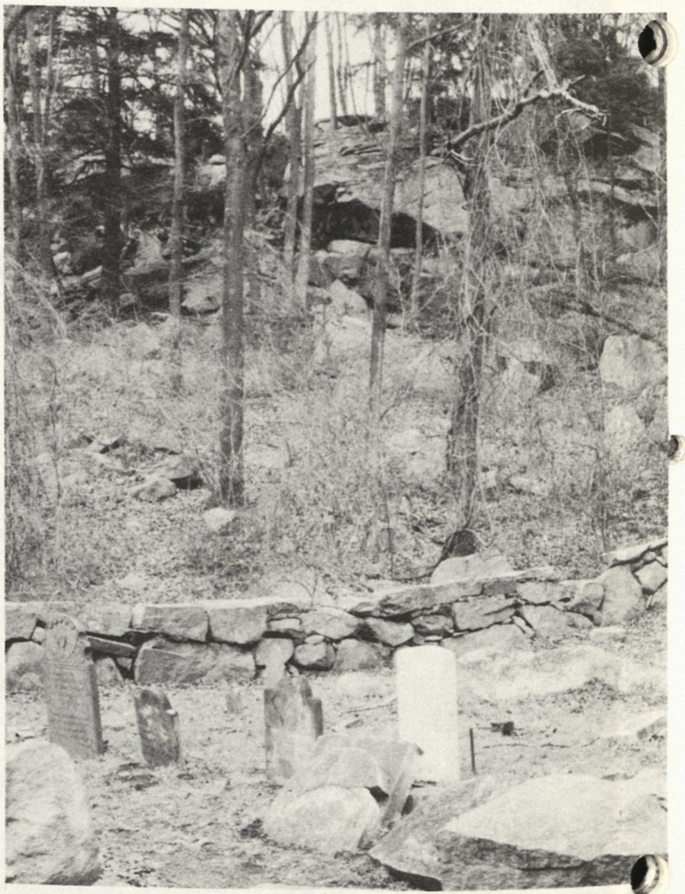
Stoddard Hill is a dramatic geographic feature. Rising 170 feet above the Thames, it offers a striking view of the river, particularly in the fall and winter seasons, making it well worth the effort of braving the hill's little-used hiking trails.

Less known is the park's historic significance. For 200 years the site of a tavern run by the Stoddard family, the park contains a cemetery with at least one Revolutionary-era grave, as well as that of Hibbart Stoddard, who participated in the Battle of Stonington in 1814.

The site's historic significance goes even farther back, into at least the 17th century, when the hill was a favorite Indian look-out. From this point the Pequots and Narragansetts kept an eye on the Mohegans at their Fort Shantok encampment on the opposite shore of the Thames.

A local organization has urged the state to leave the site undeveloped rather than lose it as an archeological resource. The park is beautiful in its wildness.

Stoddard Hill State Park is on Route 12, five miles south of Norwich.



The Indian lookout at Stoddard Hill State Park rises 170 feet high; Revolutionary War and War of 1812 veterans lie in the family plot below.

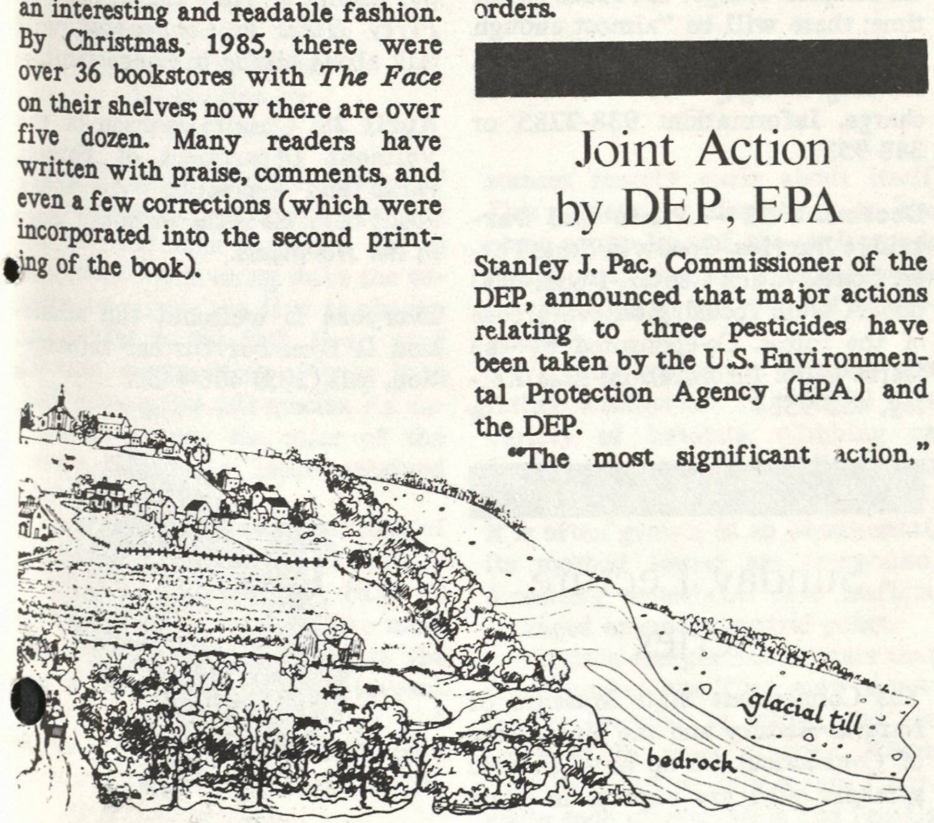
The Bulletin Board

The Face of Connecticut

It took DEP's Natural Resources Center three years to consider, compose, and complete the book *The Face of Connecticut*. It then took five months to completely sell out the first printing. On November 15 of this year, *The Face of Connecticut: People, Geology and the Land* will quietly celebrate its first year of publication. It has been a successful year.

The enthusiastic response from the public and press came as a welcome surprise. The Natural Resources Center had no experience in reaching out to the public at large. Moreover, no one knew for certain how many people would really be interested in learning about the geology and landscapes of Connecticut and their link to the state's land use history.

Our sales have clearly shown that people *are* interested in five hundred million years of geologic history, as long as it is presented in an interesting and readable fashion. By Christmas, 1985, there were over 36 bookstores with *The Face* on their shelves; now there are over five dozen. Many readers have written with praise, comments, and even a few corrections (which were incorporated into the second printing of the book).



Publicity Helped

The *Face of Connecticut* was fortunate to have been reviewed in *The New York Times*, *The Hartford Courant*, and many local newspapers. They, in addition to the *Citizens' Bulletin*, got the word out and around. To quote from *The Hartford Courant*: "The well illustrated, easy to understand book . . . touches everything from the drifting continents to the wanderings of dinosaurs, from the hills, valleys and shoreline to deposits of traprock, brownstone, and various minerals."

We are glad to report that *The Face of Connecticut* is available and in good supply. It can be ordered from the DEP, Maps and Publications Office, Room 555, 165 Capitol Avenue, Hartford, CT 06106 for $15.92. That price includes *The Face of Connecticut*, tax, postage and handling, or UPS delivery. Checks are payable to DEP Publications. Bookstores, schools, and colleges are welcome to call (203) 566-7719 for information on bulk orders.

Joint Action by DEP, EPA

Stanley J. Pac, Commissioner of the DEP, announced that major actions relating to three pesticides have been taken by the U.S. Environmental Protection Agency (EPA) and the DEP.

"The most significant action," Pac said, "is an emergency suspension of products containing dinoseb, due to its potential for causing birth defects."

An emergency suspension is the most drastic action the EPA can take to stop the use of a pesticide. The EPA has information suggesting that the exposure of pregnant women to dinoseb in the field may pose a significant risk of birth defects.

Pac and the EPA emphasized that exposure through the food chain does not pose a risk. Dinoseb is most commonly used in Connecticut as a weed killer in corn fields. It is also used as a vine killer on potato crops and as a general weed killer on a variety on other crops.

"Dicofol," Pac said, "which kills mites, is sold commonly under the trade name Kelthane. This product has been subjected to a stop sale by the EPA due to contamination with DDT and related compounds. The terms of the stop sale state that products manufactured by Rohm and Haas Company after June 29, 1986, must be recalled. Products that are not under the control of Rohm and Haas," he continued, "may be sold until they are used up."

This action is being taken because the company could not reduce DDT and related compounds to an acceptable level. The major problem with DDT is its effect on wildlife, especially birds and fish. The endangered peregrine falcon was a major concern of the EPA, particularly in California, where most dicofol has been used. In Connecticut, dicofol is applied mainly to ornamentals, with some use on other crops.

"The use of diazinon is being halted on golf courses and sod farms," Pac said. "The EPA and DEP have documented many bird kills resulting from the use of diazinon on such sites, including some in Connecticut. Diazinon is a commonly used chemical. We are pleased to see that EPA is curtailing those uses that may result in bird kills."

The Connecticut DEP is in the forefront in the enforcement of these new actions. The DEP has a cooperative enforcement agreement with the EPA for enforcement actions within Connecticut.

"We do support the EPA on all these actions," Pac said. "We will do our best to inform the user community and take any enforcement actions necessary." ■

Upcoming DEP Events

November 2 — Thematic Walk: The Two Faces of Winter. Goodwin State Forest Conservation Center, 1 p.m.-3 p.m. Prepare for the challenge of winter and consider the ways in which the rest of the animal world prepares. Bring a quotation appropriate to the season. Goodwin State Forest Conservation Center (just off Rt. 6 in Hampton — 10 miles east of Willimantic). Information: Lois Kelly, 455-9534.

November 15 — Birdfeeder Workshop. Goodwin State Forest Conservation Center, 1 p.m.-4 p.m. Parent/child workshop. Participants will build a feeder and learn about bird feeding. Advance registration required; charge for materials. Information: Lois Kelley, 455-9534.

November 22 — A Taste of Thanksgiving with the Second Continental Light Dragoons. Putnam Memorial State Park. Come see "Connecticut's Valley Forge." The Second Continental Light Dragoons will demostrate Revolutionary War-era cabin life in winter. Meet the soldiers. Sample the foods of the time; there will be "almost enough to go around." Routes 58 and 107, Redding/Bethel; no admission charge. Information: 938-2285 or 348-9537.

November 29 — Annual Victorian Christmas at Gillette Castle. Gillette Castle State Park — *weekends until Christmas*, 10 a.m.-4 p.m. William Gillette's quirky castle is specially decked out in Victorian-style Christmas decorations and offers an assortment of holiday musical performances suitable to the season. Information: 526-2336.

November 30 — Decorations and Ornaments from Natural Materials. Goodwin State Forest Conservation Center, 1 p.m-3:30 p.m. Make small decorative items using forest materials. Co-sponsored by the Sierra Club. Advance registration required; $2 per person, $3 per parent/child pair.Information: Lois Kelley, 455-9534.

December 20 — A Christmas Visit with the Second Continental Light Dragoons. Putnam Memorial State Park. Come see "Connecticut's Valley Forge." The Second Continental Light Dragoons will demonstrate Revolutionary War-era cabin life in winter. Meet the soldiers. Sample the foods of the time; there will be "almost enough to go around." Routes 58 and 107, Redding/Bethel; no admission charge. Information: 938-2285 or 348-9537.

December 28 — Pines and Partridge Berries. Goodwin State Forest Conservation Center, 1 p.m.-2:30 p.m. A walk focusing on evergreens of the forest. Co-sponsored by the Sierra Club. Information: Lois Kelley, 455-9534 ■

Sunday Lecture Series

The Connecticut State Museum of Natural History and the University of Connecticut Co-op have invited speakers who are experts in their fields to participate in an inform Sunday lecture series. The lectures will be held in the Benton Connection Art Gallery of the Jorgensen Auditorium Building. The programs will commence at 3:00 p.m. and include a reception with refreshments following each talk.

Guest speakers will be happy to autograph copies of their books after their talks. Books will be available at the UConn Co-op and at the lectures.

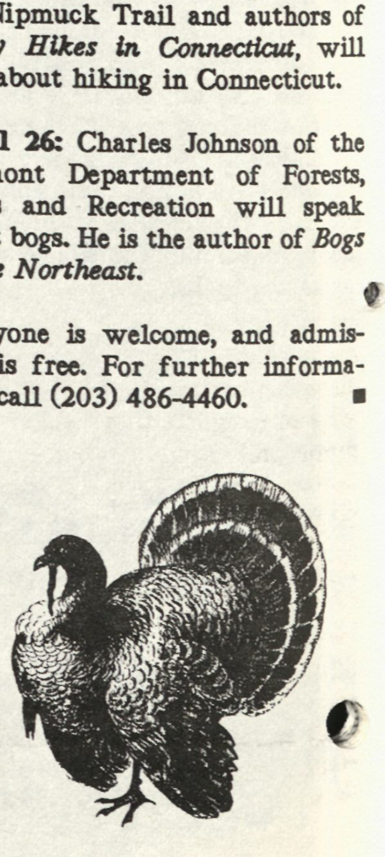
November 9: Michael Bell, author of *Face of Connecticut: People, Geology and the Land*, published by the Connecticut DEP, will talk about the natural history of Connecticut.

February 15: Harry S. Stout of Yale will give a lecture based on his book, *New England Soul.* Stout has done extensive research on sermons as a form of communication in early New England.

March 29: Gerry and Sue Hardy, trail chairpersons for a portion of the Nipmuck Trail and authors of *Fifty Hikes in Connecticut*, will talk about hiking in Connecticut.

April 26: Charles Johnson of the Vermont Department of Forests, Parks and Recreation will speak about bogs. He is the author of *Bogs in the Northeast.*

Everyone is welcome, and admission is free. For further information, call (203) 486-4460. ■



Experimental Program

As part of an experimental program at Black Rock State Park this summer, six special young men between the ages of 17 and 21, all residents of the Waterbury Center, worked at cleaning picnic sites, raking, picking up trash, and clearing weeds. The young men worked five days a week, about three hours a day, from July 7 to August 1. They each received for this labor, in addition to swimming privileges at the park, about $100, or about one sixth of the $600 allotted to the program. The young men are special in that they are all mentally retarded.

"When they asked me if I wanted to become involved in this program," said Daniel Dickinson, Park Manager at Black Rock State Park, "they didn't have to twist my arm. There are lots of little jobs that need to be done here, and now they're getting done."

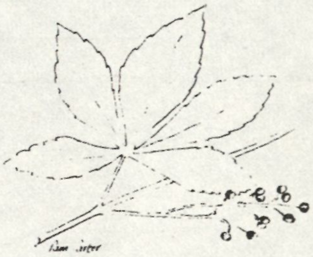
There are other benefits, in addition to keeping the park just that much neater, that are derived from this program. The young men themselves get a sense of self-esteem and pride in their work, knowing that what they do has value. They know this because they can see the results and they are being payed for their labor. Also, visitors to the park see the young men hard at work, and often come to a new understanding of mental retardation. In this program, old misconceptions rapidly fall away. ■

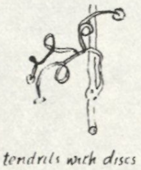
Members of a work crew at Black Rock State Park, part of an experimental program that has proved a success.

Trailside Botanizer

The Virginia Creeper

by
Gale W. Carter
Illustration by
Pam Carter





The brilliant red autumn leaves of the Virginia creeper (*Parthenocissus quinquefilia*) seem to scream out to be noticed. They, along with the sumacs, are among the first to change their color in the fall. Even at a distance, at this time of year it is easy to recognize this species. As autumn progresses, the color of the leaves becomes a more subdued pink.

One of the unique features of this member of the grape family (*Vitaceae*) is the way it lifts its leaves toward the sun. Unlike most vines, it has adhesive discs at the end of its tendrils (modified leaves). They can attach to wood, brick, and stone. Any tendril that doesn't come in contact with one of these substances merely curls about itself. This amazing adaptation is the plant equivalent of the sticky pads found on the feet of the diminutive northern grape tree frog (*Hyla versicolor*).

Virginia creeper is common and rather widespread. It is found in a variety of habitats, climbing on fences, stone walls, buildings, and trees. Because it is easily propagated, it is often grown as an ornamental. Its toothed leaves are compound, consisting usually of five leaflets, arranged around a central point.

Virginia creeper has flowers that are inconspicuous. They may be yellow to greenish to white, and are arranged in erect clusters. There may be many or only a few flowers in each cluster. Male and female structures may be in the same flower or in separate flowers on the same plant. The blooming time is from July to August.

The fruit consists of powder-blue berries that are up to one half inch in diameter. They are present from August to February. The berries are valuable fall and winter food for many birds, including the mockingbird, bird thrasher, red-eyed vireo, and pileated woodpecker. White-tailed deer feed on the leaves and twigs. ■

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Endnote

I still feel there is a case to be made for my old belief that as man approaches the "new heaven and the new earth" — or the space age universe — he must do so with humility rather than arrogance. And along with humility, I think there is still a place for wonder.

Rachel Carson

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